Setting Up A Prototype For The Artificial Interactive Reality Unified System (Airus) To Transform Psychosocial Intervention Environment In Occupational Therapy

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Abstract : Background. Many children with high incidence disabilities, such as autism spectrum disorder (ASD), struggle to participate in the community in a socially acceptable manner. Occupational therapy practitioners often find difficulties in creating natural scenarios in clinics for their clients to practice the life skills needed to overcome their real-life challenges. Virtual reality (VR) offers potential solutions to resolve the existing limitation faced by clinicians to create natural environments for their clients to generalize the facilitated skills. Prototype Design. The AIRUS project involved design and development of an interactive VR data management system that made use of 3D camera, Oculus Quest Pro's tracking tools, and the Unity game engine to create simulated real-life social scenarios, in which the users interact with people, objects, and environmental elements inside the virtual environment through the use of natural eye-gazes. The eye tracking (e.g., selective or joint attention), hand- or body-tracking (e.g., repetitive stimming or fidgeting), and facial tracking (e.g., emotion recognition) functions allow behavioral data to be captured and managed in the AIRUS architecture: Impact of project: Using 360-degree video footage of real life to create the surrounding environment, we place our users in a simulated daily life environment to feel as natural and realistic as possible. Instead of using external controllers or sensors, the hand tracking software enables the users to interact naturally with the simulated environment using daily life behavior such as hand shaking and waving to control and interact with the virtual environment. These two innovative aspects of the AIRUS alone carry the existing interactive VR technology to the next horizon and open numerous possibilities for breakthroughs in psychosocial assessment and intervention design in occupational therapy. Implications: Extending from this pilot AIRUS prototype, AI technology will be deployed to identify the objects and people in the 360-degree videos to allow more efficient data capturing and interpretation, such as where our user is looking at any given moment. This will allow us to quickly identify objects in the videos and convert them into data points that the software will be able to use. These datapoints can be used to pinpoint our users' focus and where their interests lie. Additionally, AI can help us draw meaningful conclusions from the data and form helpful conclusions at an accelerated pace.

Keywords : interactive virtual reality, occupational therapy, interactive environment, artificial intelligence

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